

TITLE OF THE INVENTION

INFORMATION PROCESSING APPARATUS, IMAGE INPUT APPARATUS,
METHOD OF CONTROLLING IMAGE PROCESSING APPARATUS,
5 METHOD OF CONTROLLING IMAGE INPUT APPARATUS, IMAGE
INPUT SYSTEM, AND STORAGE MEDIUM

BACKGROUND OF THE INVENTION

10 Field of the Invention

The present invention relates to an information processing apparatus which is capable of performing image processing on input image data, an image input apparatus, a method of controlling the image processing
15 apparatus, a method of controlling the image input apparatus, an image input system, and a storage medium storing programs for implementing these methods.

Description of the Related Art

20 An image input system has been proposed, which is comprised of an image input apparatus such as a scanner having an original feeding function of continuously feeding originals, and an information processing apparatus such as a personal computer (PC) connected to
25 the scanner via a cable or the like.

On a scanner side of an image input system of this kind, in general, after a first sheet of a bundle of

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originals has been fed and image data from that original sheet has then been input by an image input section, an image processing section performs image correction processing on the input image by adjusting
5 the brightness and/or contrast thereof or binarizing the image data.

In this image correcting processing, in a mode for inputting multivalued gray or color images, multivalued image data is input from an original, the input image
10 data is subjected to a gamma correction, which corresponds to a set contrast, and a difference corresponding to a set brightness is added to the multivalued data. On the other hand, in a mode for inputting binary images, multivalued image data is
15 input from an original, the input image data is then transformed into binary data using a slice level corresponding to a set brightness as a boundary without adjusting the contrast and brightness.

The image data thus subjected to the image
20 correction processing on the scanner side is transmitted to a personal computer (PC) side, where the image data is stored in a hard disk as, for example, an image file.

In this image input system, however, the image
25 correcting processing including the brightness and contrast adjustment and binarization is executed only on the scanner side. Thus, if the image data obtained

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after the image input and corrections does not have a brightness and/or contrast desired by the user, the setting for the brightness and/or contrast has to be changed, and a first sheet of the original bundle has to be set in an original feeding means again to input the image. This operation has to be repeated until the optimal brightness and/or contrast is obtained. Therefore, the conventional image input operation is inefficient.

SUMMARY OF THE INVENTION

It is an object of the present invention to solve the above-mentioned problems by providing an information processing apparatus which is capable of enhancing the efficiency of an image input operation by enabling a desired input image to be obtained without reentering the image by an image input apparatus, as well as a method of controlling the information processing apparatus, an image input system, and a storage medium storing a program for executing the method.

To attain the above object, a first aspect of the present invention provides an information processing apparatus connected to an image input apparatus which is capable of executing predetermined image processing on input image data and outputting the processed image

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data, the information processing apparatus comprising
first storage means for storing image data output
from the image input apparatus, instruction input means
for inputting setting information for image processing
5 according to an instruction from an operator, and image
processing means for executing image processing that
can be executed by the image input apparatus, on the
image data stored in the first storage means based on
the setting information input by the instruction input
10 means.

In a typical embodiment of the first aspect, the
image input apparatus is a scanner apparatus having an
image processing section that executes predetermined
image processing on image data input by reading an
15 image, and the first storage means stores image data
transmitted from the scanner apparatus.

The image processing section of the scanner
apparatus executes image processing related to image
correction, and the image processing means executes
20 image correction that can be executed by the image
processing section of the scanner apparatus.

The image correction includes processes related to
contrast adjustment, brightness adjustment, and
binarization of an image.

25 The scanner apparatus further includes an image
input section that feeds an original and inputs image
data by reading an image from the fed original.

5 Preferably, the image processing means executes
image processing on image data temporarily stored in
the storage means and the display means displays the
processed image data, before the instruction input
means inputs set values.

15 information.

Preferably, the information processing apparatus
25 according to the first aspect further comprises
selecting means for selecting either a first mode in
which the image input apparatus executes the image

processing or a second mode in which the information processing apparatus executes the image processing, according to an instruction input by the operator.

In a typical application of the present invention,
5 the image input apparatus is a scanner apparatus, and the information processing apparatus is a personal computer connected to the scanner apparatus via a communication cable.

Preferably, the information processing apparatus
10 according to the first aspect further comprises transmitting means for transmitting the setting information used for the image processing by the image processing means, to the image input apparatus.

In a preferred embodiment of the first aspect, the
15 transmitting means transmits the setting information to the image input apparatus after first image data stored in the first storage means has been processed by the image processing means.

Preferably, the information processing apparatus
20 according to the first aspect further comprises display means for displaying the image data processed by the image processing means.

More preferably, the image input apparatus is a
25 scanner apparatus having an image processing section that executes predetermined image processing on image data input by reading an image, and the first storage means stores image data transmitted from the scanner

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apparatus.

Further preferably, the image processing section of the scanner apparatus executes image processing related to image correction based on the setting
5 information transmitted from the transmitting means, and the image processing means executes image correction that can be executed by the image processing section of the scanner apparatus.

To attain the above object, the first aspect of
10 the present invention also provides a method of controlling an information processing apparatus connected to an image input apparatus which is capable of executing predetermined image processing on input image data and outputting the processed image data, the
15 method comprising a first storing step of storing image data output from the image input apparatus, in a storage section, an instruction input step of inputting setting information for image processing according to an instruction from an operator, and an image
20 processing step of executing image processing that can be executed by the image input apparatus, on the image data stored in the storage section based on the setting information input in the instruction input step.

To attain the above object, the first aspect of
25 the present invention further provides a computer-readable storage medium storing a program code for implementing a method of controlling an information

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processing apparatus connected to an image input apparatus which is capable of executing predetermined image processing on input image data and outputting the processed image data, the program code comprising a
5 storing module for storing image data output from the image input apparatus, in a storage section, an instruction input module for inputting setting information for image processing according to an instruction from an operator, and an image processing
10 module for executing image processing that can be executed by the image input apparatus, on the image data stored in the storage means based on the setting information input by the instruction input module.

15 It is another object of the present invention to provide an information processing apparatus which is capable of enhancing the efficiency of an image input operation by enabling a desired input image to be obtained without reentering the image by a scanner
20 apparatus two or more times, as well as a method of controlling the information processing apparatus, and a storage medium storing a program for executing the method.

25 To attain the above object, a second aspect of the present invention provides an information processing apparatus connected via a communication cable to a scanner apparatus, the scanner apparatus comprising an

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image input section that feeds an original and inputs
image data by reading an image from the fed original,
and an image correcting section that executes
predetermined image correction on the image data input
5 by the image input section, the scanner apparatus being
capable of transmitting the image data corrected by the
image correcting section, the information processing
apparatus comprising first storage means for storing
image data transmitted from the scanner apparatus,
10 first image correcting means for executing image
correction that can be executed by the scanner
apparatus, on the image data stored in the first
storage means, display means for displaying the
corrected image data, instruction input means for
15 inputting setting information for image correction
according to an instruction from an operator, second
image correcting means for executing image correction
that can be executed by the scanner apparatus, on the
image data stored in the first storage means based on
20 the setting information input by the instruction input
means, and second storage means for storing the image
data corrected by the second image correcting means.

To attain the above object, the second aspect of
the present invention also provides a method of
25 controlling an information processing apparatus
connected via a communication cable to a scanner
apparatus, the scanner apparatus comprising an image

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input section that feeds an original and inputs image data by reading an image from the fed original, and an image correcting section that executes predetermined image correction on the image data input by the image

5 input section, the scanner apparatus being capable of transmitting the image data corrected by the image correcting section, the method comprising a first storing step of storing image data transmitted from the scanner apparatus, in a storage section, a first image

10 correcting step of executing image correction that can be executed by the scanner apparatus, on the image data stored in the first storing step, a display step of displaying the corrected image data, an instruction input step of inputting setting information for image

15 correction according to an instruction from an operator, a second image correcting step of executing image correction that can be executed by the scanner apparatus, on the image data stored in the first storing step based on the setting information input in

20 the instruction input step, and a second storing step of storing the image data corrected in the second image correcting step, in a storage section.

It is still another object of the present invention to provide an information processing

25 apparatus which is capable of enhancing the efficiency of an image input operation by enabling a desired input image to be obtained without reentering the image by a

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image data stored in the first storage means based on the setting information input by the instruction input means, second storage means for storing the image data corrected by the second image correcting means, third
5 storage means for storing the setting information input by the instruction input means, fourth storage means for storing image data on second and subsequent original sheets transmitted from the scanner apparatus, in response to storing of the image data on the first
10 original sheet in the second storage means, third image correcting means for executing image correction that can be executed by the scanner apparatus, on the image data stored in the fourth storage means based on the setting information stored in the third storage means,
15 and fifth storage means for storing the image data corrected by the third image correcting means.

To attain the above object, the third aspect of the present invention also provides a method of controlling an information processing apparatus
20 connected via a communication cable to a scanner apparatus the scanner apparatus comprising an image input section that feeds an original and inputs image data by reading an image from the fed original, and an image correcting section that executes predetermined
25 image processing on the image data input by the image input section, the scanner apparatus being capable of transmitting the image data corrected by the image

correcting section, the method comprising a first storing step of storing image data on a first original sheet transmitted from the scanner apparatus, in a storage section, a first image correcting step of

5 executing image correction that can be executed by the scanner apparatus, on the image data stored in the first storing step, a display step of displaying the corrected image data, an instruction input step of inputting setting information for image correction

10 according to an instruction from an operator, a second image correcting step of executing image correction that can be executed by the scanner apparatus, on the image data stored in the first storing step based on the setting information input in the instruction input

15 step, a second storing step of storing the image data corrected in the second image correcting step, in a storage section, a third storing step of storing the setting information input in the instruction input step, in a storage section, a fourth storing step of storing

20 image data on second and subsequent original sheets transmitted from the scanner apparatus in a storage section, in response to storing of the image data on the first original sheet in the second storing step, a third image correcting step of executing image

25 correction that can be executed by the scanner apparatus, on the image data stored in the fourth storing step based on the setting information stored in

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the third storing step, and a fifth storing step of storing the image data corrected in the third image correcting step, in a storage section.

- It is a further object of the present invention to
- 5 provide an information processing apparatus which is capable of enhancing the efficiency of an image input operation and further improving an image input processing speed, by enabling a desired input image to be obtained without reentering the image by a scanner
- 10 apparatus two or more times, and by reducing the time and labor for carrying out setting operations by an operator, as well as a method of controlling the information processing apparatus, and a storage medium storing a program for executing the method.
- 15 To attain the above object, a fourth aspect of the present invention provides an information processing apparatus connected via a communication cable to a scanner apparatus, the scanner apparatus comprising an image input section that feeds an original and inputs
- 20 image data by reading an image from the fed original, and an image correcting section that executes predetermined image processing on the image data input by the image input section, the scanner apparatus being capable of transmitting the image data corrected by the
- 25 image correcting section, the information processing apparatus comprising first storage means for storing image data on a first original sheet transmitted from

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the scanner apparatus, first image correcting means for
executing image correction that can be executed by the
scanner apparatus, on the image data stored in the
first storage means, display means for displaying the
5 corrected image data, instruction input means for
inputting setting information for image correction
according to an instruction from an operator, second
image correcting means for executing image correction
that can be executed by the scanner apparatus, on the
10 image data stored in the first storage means based on
the setting information input by the instruction input
means, second storage means for storing the image data
corrected by the second image correcting means,
transmitting means for transmitting the setting
15 information input by the instruction input means, to
the scanner apparatus, and third storage means for
storing image data on second and subsequent original
sheets which have been transmitted from the scanner
apparatus after being corrected based on the setting
20 information by the image correcting section of the
scanner apparatus.

To attain the above object, the fourth aspect of
the present invention also provides a method of
controlling an information processing apparatus
25 connected via a communication cable to a scanner
apparatus, the scanner apparatus comprising an image
input section that feeds an original and inputs image

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corrected based on the setting information by the image
correcting section of the scanner apparatus.

It is a still further object of the present
invention to provide an information processing
5 apparatus which allows an operator to determine whether
an image input apparatus or the information processing
apparatus is to execute image processing on the input
image, depending on the operator's needs, as well as a
method of controlling the information processing
10 apparatus.

To attain the above object, a fifth aspect of the
present invention provides an information processing
apparatus connected to an image input apparatus which
is capable of executing predetermined image processing
15 on input image data and outputting the processed image
data, the information processing apparatus comprising
selecting means for selecting either a first mode in
which the image input apparatus executes image
processing or a second mode in which the image
20 processing apparatus executes image processing,
according to an instruction input by an operator,
storage means for storing image data output from the
image input apparatus, instruction input means for
inputting setting information for image processing
25 according to an instruction from an operator, and image
processing means for executing image processing on the
image data stored in the storage means based on the

setting information input by the instruction input means, if the selecting means selects the second mode.

To attain the above object, the fifth aspect of the present invention also provides a method of

5 controlling an information processing apparatus connected to an image input apparatus which is capable of executing predetermined image processing on input image data and outputting the processed image data, the method comprising a selecting step of selecting either

10 a first mode in which the image input apparatus executes image processing or a second mode in which the image processing apparatus executes image processing, according to an instruction input by an operator, a storing step of storing image data output from the

15 image input apparatus, in a storage section, an instruction input step of inputting setting information for image processing according to an instruction from an operator, and an image processing step of executing image processing on the image data stored in the

20 storing step based on the setting information input in the instruction input step, if the second mode is selected in the selecting step.

It is another object of the present invention to provide an information processing apparatus which is

25 capable of enhancing the speed of image processing on the input image, as well as a method of controlling the information processing apparatus.

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To attain the above object, a sixth aspect of the present invention provides an information processing apparatus connected to an image input apparatus which is capable of executing predetermined image processing on input image data and outputting the processed image data, the information processing apparatus comprising storage means for storing image data output from the image input apparatus, instruction input means for inputting setting information for image processing according to an instruction from an operator, image processing means for executing image processing on the image data stored in the storage means based on the setting information input by the instruction input means, and transmitting means for transmitting the setting information used for the image processing by the image processing means, to the image input apparatus.

To attain the above object, the sixth aspect of the present invention also provides a method of controlling an information processing apparatus connected to an image input apparatus which is capable of executing predetermined image processing on input image data and outputting the processed image data, the method comprising a storing step of storing image data output from the image input apparatus, in a storage section, an instruction input step of inputting setting information for image processing according to an

instruction from an operator, an image processing step of executing image processing on the image data stored in the storing step based on the setting information input in the instruction input step, and a transmitting
5 step of transmitting the setting information used for the image processing in the image processing step, to the image input apparatus.

It is still another object of the present invention to provide an image input apparatus which is
10 capable of enhancing the efficiency of an image input operation by enabling a desired input image to be obtained without reentering the image by the image input apparatus, as well as a method of controlling the image input apparatus, an image input system, and a
15 storage medium storing a program for executing the method.

To attain the above object, a seventh aspect of the present invention provides an image input apparatus connected to an information processing apparatus which
20 is capable of executing predetermined image processing on input image data and storing the processed image data, the image input apparatus comprising input means for inputting image data, and image processing means for executing image processing that can be executed by
25 the image processing apparatus, on the image data input by the input means, and the image processing means executes image processing on the image data input by

the input means, depending on contents of image processing executed by the image processing apparatus.

Preferably, the information processing apparatus executes image processing on the image data based on
5 setting information input by an operator, and the image processing means executes image processing on the image data input by the input means, based on the setting information transmitted from the image processing apparatus.

10 In a preferred embodiment of the seventh aspect, the image input apparatus further comprises determining means for determining whether the image data input by the input means is from a first original sheet, and if the determining means determines that the image data is
15 from the first original sheet, the image processing means does not execute image processing on the image data input by the input means, and if the determining means determines that the image data is not from the first original sheet, the image processing means
20 executes image processing on the image data input by the input means.

In a typical embodiment, the image input apparatus is a scanner apparatus, and the input means inputs image data by reading an image.

25 Preferably, the image processing means executes image processing related to image correction, and the image processing apparatus executes image correction

that can be executed by the image processing means.

Typically, the image correction includes processing related to contrast adjustment, brightness adjustment, and binarization of an image.

- 5 In a preferred embodiment, the input means inputs image data by reading an image, and if the determining means determines that the image data is not from the first original sheet, the input means inputs image data by continuously reading second and subsequent original
10 sheets, and the image processing means executes image processing on the image data input by the input means..

- Preferably, the image input apparatus is a scanner apparatus, and the image processing apparatus is a personal computer connected to the scanner apparatus
15 via a communication cable.

- To attain the above object, the seventh aspect of the present invention also provides a method of controlling an image input apparatus connected to an information processing apparatus which is capable of
20 executing predetermined image processing on input image data and storing the processed image data, the method comprising an input step of inputting image data, an image processing step of executing image processing that can be executed by the image processing apparatus,
25 on the image data input in the input step, and the image processing step comprises executing image processing on the image data input in the input step,

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depending on contents of image processing executed by the image processing apparatus.

To attain the above object, the seventh aspect of the present invention further provides a computer-
5 readable storage medium storing a program code for implementing a method of controlling an image input apparatus connected to an information processing apparatus which is capable of executing predetermined image processing on input image data and storing the
10 processed image data, the program code comprising an input module for inputting image data, and an image processing module for executing image processing that can be executed by the image processing apparatus, on the image data input by the input module, and the image
15 processing module executes image processing on the image data input by the input module, depending on contents of image processing executed by the image processing apparatus.

It is a further object of the present invention to
20 provide a scanner apparatus which is capable of enhancing the efficiency of an image input operation and further improving an image input processing speed, by enabling a desired input image to be obtained without reentering the image by the scanner apparatus
25 two or more times, and by reducing the time and labor for carrying out setting operations by an operator, as well as a method of controlling the scanner apparatus,

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and a storage medium storing a program for executing the method.

To attain the above object, an eighth aspect of the present invention provides a scanner apparatus
5 connected to an image processing apparatus which is capable of executing predetermined image correction on input image data based on setting information input by an operator and storing the corrected image data, the scanner apparatus comprising input means for feeding an
10 original and inputting image data by reading an image from the fed original, image processing means for executing image correction that can be executed by the image processing apparatus, on the image data input by the input means, and determining means for determining
15 whether the image data input by the input means is from a first original sheet, and if the determining means determines that the image data is not from the first original sheet, the image processing means executes image processing on the image data input by the input
20 means, based on the setting information transmitted from the image processing apparatus.

To attain the above object, the eighth aspect of the present invention also provides a method of
controlling a scanner apparatus connected to an image
25 processing apparatus which is capable of executing predetermined image correction on input image data based on setting information input by an operator and

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storing the corrected image data, the method comprising
an input step of feeding an original and inputting
image data by reading an image from the fed original,
an image processing step of applying image correction
5 that can be executed by the image processing apparatus,
on the image data input in the input step, and a
determining step of determining whether the image data
input in the input step is from a first original sheet,
and if it is determined in the determining step that
10 the image data is not from the first original sheet,
the image processing step executes image processing on
the image data input in the input step, based on the
setting information transmitted from the image
processing apparatus.

15 It is another object of the present invention to
provide an image input apparatus which allows the
operator to determine whether the image input apparatus
or an information processing apparatus is to execute
image processing on the input image, depending on the
20 operator's needs, as well as a method of controlling
the image input apparatus.

To attain the above object, a ninth aspect of the
present invention provides an image input apparatus
connected to an information processing apparatus which
25 is capable of executing predetermined image processing
on input image data and storing the processed image
data, the image input apparatus comprising input means

for inputting image data, image processing means for
executing image processing on the image data input by
the input means, and if the image processing apparatus
is to execute image processing on the image data input
5 by the input means, the image processing means does not
execute image processing on the image data input by the
input means.

To attain the above object, the ninth aspect of
the present invention also provides a method of
10 controlling an image input apparatus connected to an
information processing apparatus which is capable of
executing predetermined image processing on input image
data and storing the processed image data, the method
comprising an input step of inputting image data, an
15 image processing step of executing image processing on
the image data input in the input step, and if the
image processing apparatus is to execute image
processing on the image data input in the input step,
image processing on the image data input in the input
20 step is not executed in the image processing step.

Further, to attain one or more of the above
objects, the present invention provides an image input
system including an image input apparatus which is
capable of executing predetermined image processing on
25 input image data and outputting the processed image
data, and an image processing apparatus connected to
the image input apparatus, wherein the image input

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apparatus comprises input means for inputting image data, and first image processing means for executing image processing on the image data input by the input means, wherein the information processing apparatus

5 comprises storage means for storing image data output from the image input apparatus, instruction input means for inputting setting information for image processing according to an instruction from an operator, and second image processing means for executing image

10 processing that can be executed by the first image processing means, on the image data stored in the storage means based on the setting information input by the instruction input means, and wherein the first image processing means executes image processing on the

15 image data input by the input means, depending on contents of image processing executed by the second image processing means.

Further, to attain one or more of the above objects, the present invention provides an image input

20 system including a scanner apparatus comprising an image input section that feeds an original and inputs image data by reading an image from the fed original, and an image correcting section that executes predetermined image processing on the image data input

25 by the image input section, the scanner apparatus being capable of transmitting the image data corrected by the image correcting section, to an external apparatus, and

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an image processing apparatus connected to the scanner apparatus via a communication cable, wherein the scanner apparatus comprises input means for feeding an original and inputting image data by reading an image from the fed original, first image correcting means for executing image correction on the image data input by the input means, and determining means for determining whether the image data input by the input means is from a first original sheet, wherein the information processing apparatus comprises first storage means for storing image data transmitted from the scanner apparatus, second image correcting means for executing image correction that can be executed by the first image correcting means, on the image data stored in the first storage means, display means for displaying the corrected image data, instruction input means for inputting setting information for the image correction according to an instruction from an operator, third image correcting means for executing image correction that can be executed by the first image correcting means, on the image data stored in the first storage means based on the setting information input by the instruction input means, and second storage means for storing the image data corrected by the third image correcting means, and wherein if the determining means determines that the image data is not from a first original sheet, the first image correcting means

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executes image correction on the image data input by the input means, based on the setting information transmitted from the information processing apparatus.

The above and other objects, features, and

- 5 advantages of the present invention will become more apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

10

FIG. 1 is a schematic view of an image input system according to a first embodiment of the present invention;

- 15 FIG. 2 is a sectional view schematically showing the structure of a scanner 1 shown in FIG. 1;

FIG. 3 is a functional block diagram schematically showing the constitution of a personal computer (PC) 2 shown in FIG. 1;

- 20 FIG. 4 is a flow chart showing an image correction selecting process;

FIG. 5 is a flow chart showing an image input process in a scanner-side image correcting mode;

FIG. 6 is a flow chart showing an image correcting process (step S105) shown in FIG. 5;

- 25 FIG. 7 is a flow chart showing the operation of the image input system according to the first embodiment;

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FIG. 8 is a continued part of the flow chart of
FIG. 7;

FIG. 9 is a flow chart showing the operation of an
image input system according to a second embodiment of
5 the present invention;

FIG. 10 is a continued part of the flow chart of
FIG. 9;

FIG. 11 is a flow chart showing the operation of
an image input system according to a third embodiment
10 of the present invention; and

FIG. 12 is a continued part of the flow chart of
FIG. 11.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

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The present invention will be described below with
reference to the drawings showing preferred embodiments
thereof.

[First Embodiment]

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FIG. 1 is a schematic view of an image input
system according to a first embodiment of the present
invention.

The image input system is comprised of a scanner 1
for executing the input of image data and the like, and
25 a personal computer (PC) 2 for displaying and saving
the image data. The scanner 1 and the PC 2 are
connected together via a cable 3. The cable 3

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functions as both means for transmitting the image data from the scanner 1 to the PC 2 and means for transmitting image correction settings from the PC2 to the scanner.

5 FIG. 2 is a sectional view schematically showing the structure of the scanner 1, shown in FIG. 1.

 The scanner 1 is comprised of an original tray 201 in which a bundle of originals are set, motors 202 to 206 for continuously feeding the originals to the
10 original tray 201, a sensor 207 for inputting multivalued gray or color image data from the originals, a CPU 208 for executing calculations related to image corrections such as brightness and contrast adjustment and binarization, and a sensor 209 for detecting
15 whether or not any original is set in the original tray 201.

 FIG. 3 is a functional block diagram schematically showing the constitution of the PC 2 shown in FIG. 1.

 The PC 2 includes a CPU 2 for executing
20 calculations related to the image corrections such as the brightness and contrast adjustment and the binarization, saving image data, and for controlling the scanner 1. The PC 2 also includes a keyboard 302 which is operated by a user to instruct image input to
25 be started or terminated, to determine whether the image corrections are to be executed by the scanner 1 or the PC 2, or to set the image corrections such as

the brightness and contrast adjustment and the binarization. The PC 2 also includes a memory 303 that stores images transmitted from the scanner 1 as well as settings for the image corrections, a display 304 for displaying image data as images, and a hard disk 305 that saves the image data.

Here, the image corrections executed by the CPU 301 are equivalent to those executed by the CPU 208. That is, the CPU 301 can execute the image corrections that can be executed by the CPU 208, on image data, whereas the CPU 208 can execute the image corrections that can be executed by the CPU 301, on image data. In the present embodiment, the image corrections will be described on the assumption that the CPUs 301 and 208 can each execute the contrast and brightness adjustment and the binarization process.

Further, a mouse, a touch panel, or the like may be used instead of the keyboard 302 to input settings. A floppy disk or a CD-R may be used instead of the hard disk 305.

FIG. 4 is a flow chart showing an image correction selecting process.

A user operates the keyboard 302 to select the scanner 1 or the PC 2 to be used for executing the image corrections (step S51). If the image corrections are to be executed by the scanner 1, an image input process in a scanner-side image correcting mode as

shown in FIG. 5, described later, is executed (step S52). If the image corrections are to be executed by the PC 2, an image input process in a PC-side image correcting mode as shown in FIGS. 7 and 8, described later, is executed (step S53).

First, an operation performed if the user determines that the image corrections are to be executed by the scanner 1 (the image input process in the scanner-side image correcting mode) will be described with reference to the flow chart in FIG. 5.

In the scanner 1, the sensor 209 detects whether or not any original is set in the tray (step S101). If any original is set therein, the motors 202 to 206 feed a first sheet of a bundle of originals to the original tray 201 (step S102). At this time, if no original is set in the original tray 201 (step S101) or an error such as a jam occurs while the original is being fed (step S103), the process is terminated.

Then, the sensor 207 inputs an image from the original as image data (step S104), and the image is subjected to the image correction such as the brightness and contrast adjustment or the binarization (step S105) and the image thus subjected to the image correction is fed to the PC 2 through the cable 3 (step S106). The PC 2 saves the image transmitted from the scanner 1 in the hard disk (step S107).

In the same manner as the first original sheet,

second and subsequent original sheets are fed by the
motors 202 to 206 of the scanner 1, and images from
these original sheets are input by the sensor 207,
subjected to the image correction, and then transmitted
5 to the PC 2. In the PC 2, the images transmitted from
the scanner 1 are saved in the hard disk 305.

The above operations are repeated until there is
no original set in the original tray 201 (step S101),
the process is terminated due to an error (step S103),
10 or the user inputs a command to suspend the image input,
through the keyboard 302 (step S108).

FIG. 6 is a flow chart showing an image correcting
process (step S105) shown in FIG. 5.

First, the input mode of the image data is
15 determined. If the mode is for inputting multivalued
gray or color images (step S201), then image data input
as multivalued gray or color image data are subjected
to a gamma correction corresponding to a set contrast
(step S202), and a difference corresponding to a set
20 brightness is added to the multivalued image data.

On the other hand, if the mode is for inputting
binary images (step S201), image data input as
multivalued gray image data are transformed into binary
data using a slice level corresponding the designated
25 brightness as a boundary (step S204).

Next, an operation performed if the user
determines that the image corrections are to be

The above operations are repeated until there is no original set in the original tray 201 (step S301), the process is terminated due to an error (step S303), or the user inputs a command to suspend the image input, through the keyboard 302 (step S312).

As described above, according to the present embodiment, the image data can be subjected to the image correction for parameters such as brightness and contrast as desired by the user, without the need to input the image from each original set in the original tray 201, two or more times.

[Second Embodiment]

In the second embodiment, if the user determines that the image corrections are to be executed by the PC 2, the user adjusts an image in a first original sheet but not images in second and subsequent original sheets.

FIGS. 9 and 10 are a flow chart showing the operation of an image input system according to the second embodiment of the present invention.

In the scanner 1, the sensor 209 detects whether or not any original is set in the tray (step S401). If any original is set therein, the motors 202 to 206 of the scanner 1 feed a first original sheet (step S402). Then, when the sensor 207 inputs image data from the first original sheet (step S404), the input image data is transmitted to the PC 2 without being subjected to the image correction (step S405).

In the PC 2, first, the image transmitted from the scanner 1 is stored in the memory 303 (step S406). Subsequently, the image data in the memory is subjected to the image correction (step S407), and the corrected
5 image data is displayed on the display 304 as an image (step S409). When the user then adjusts the contrast and/or brightness (steps 410) and inputs a command to determine the contrast and/or brightness (step S411), the corrected image data is saved in the hard disk 305
10 as a first image (step S412). Further, settings for the brightness, contrast, and/or the like which have been adjusted and determined using the keyboard are stored in the memory 303 (step S413).

In the same manner as the first original sheet,
15 second and subsequent original sheets are fed by the motors 202 to 206 of the scanner 1 (step S402). When the sensor 207 inputs an image from the original (step S404), the image is transmitted to the PC 2 without being subjected to the image correction (step S405).

20 In the PC 2, the image transmitted from the scanner 1 is stored in the memory 303 (step S406), and the CPU 301 then executes the image correction using the settings for the brightness, contrast, and/or the like stored in the memory 303 (step S407). Then, the
25 corrected images are saved in the hard disk 305 as second and subsequent images (steps S408 and S412).

The above operations are repeated until there is

[Third Embodiment]

In the third embodiment, if the user determines that the image corrections are to be executed by the PC 2, only a first original sheet is subjected to the
5 image correction by the PC 2, whereas second and subsequent original sheets are subjected to the image correction by the scanner 1.

FIGS. 11 and 12 are a flow chart showing the operation of an image input system according to the
10 third embodiment of the present invention. FIG. 11 shows an operation on the scanner side, and FIG. 12 shows an operation on the PC side.

In the scanner 1, the sensor 209 detects whether or not any original is set in the tray (step S501). If
15 any original is set therein, the motors 202 to 206 of the scanner 1 feed a first original sheet (step S502). Then, the sensor 207 inputs image data from the first original sheet (step S504). Then, it is determined whether or not the fed original sheet is the first
20 original sheet (the input image data is the first image data). If the fed original sheet is the first original sheet, the input image data is transmitted to the PC 2 without being subjected to the image correction (steps S505 and S506).

25 In the PC 2, it is first determined whether or not the image data transmitted from the scanner 1 is from the first original sheet (step S508). If the image

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data is from the first original sheet, the image data is stored in the memory 303 (step S509).

Subsequently, the image data stored in the memory 303 is subjected to the image correction (step S510),
5 and the corrected image data is displayed on the display 304 (step S511).

When the user then adjusts the brightness and/or contrast while referring to the displayed image (step S512) and inputs a command to determine his desired
10 brightness and/or contrast (step S513), the corrected image data is saved in the hard disk 305 as first image data (step S514).

Further, the image correction settings for the determined brightness, contrast and/or the like are
15 transmitted to the scanner 1 through the cable 3 (step S515).

Second and subsequent original sheets are fed by the motors 202 to 206 of the scanner 1 (step S502). When the sensor 207 inputs image data from each
20 original sheet (step S504), the image data is subjected to the image correction according to the settings for the brightness, contrast and/or the like which have been transmitted from the PC 2 (steps S505 and S506). Then, the corrected image data is transmitted to the PC
25 2 (step S507). In the PC 2, the image data transmitted from the scanner 1 are saved in the hard disk 305 as second and subsequent image data (steps S508 and S514).

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